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ABSTRACT

Recent studies have shown perceptual instability to be related to visual creativity as reflected in career choice. In general, those who display greater perceptual instability perceive themselves to be more creative and tend to choose careers related to visual creativity, regardless of their gender. To test the hypothesis that field independents (individuals who emphasize internal cues when making judgments on perceptual tasks) show greater perceptual instability irrespective of their gender, a sample of students representing six career areas was given the Group Embedded Figures Test and asked to indicate perceived reversals of ambiguous geometric figures. Both male and female field independent individuals displayed significantly more figural reversals, i.e., showed greater perceptual instability. Engineering and architecture students showed significantly more reversals and less field dependence than did business and education students, regardless of gender. These results add to the growing body of evidence that biological sex is not a variable in field dependence. (Author/CS)

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Field Dependence, Perceptual Instability, and Sex Differences

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Field Dependence, Perceptual Instability, and Sex Differences

Witkin (1950) first conceived of the concept of field dependence/independence as a generalized perceptual cognitive style. Individuals who emphasized internal cues while making judgments on perceptual tasks were considered field independent, while those who emphasized external cues were considered field dependent.

A field independent individual is said to be skilled in a large range of tasks that require ignoring a task-irrelevant context or focusing upon selected elements of a stimulus display. Field independence is also thought to imply an ability to restructure a problem-solving situation, to inhibit a well established response in the interest of breaking away from an unproductive set, and being able to take a fresh approach to a problem (Witkin, Lewis, Hertzman, Mackover, Meissner, & Wapner, 1954).

Field dependence/independence has been measured by a number of tests. The Body Adjustment Test (BAT) requires a subject seated in a tilted room to adjust the chair to the true upright. The Rod and Frame Test (RFT) requires a subject to sit in a darkened room in which only a rod and surrounding frame are illuminated. The subject is exposed to the rod and frame both of which deviate from the true vertical and asked to adjust the rod to the true vertical. Individuals who cannot adjust the tilting chair to the true upright when the room is tilted are generally the same ones who cannot adjust the rod to the true vertical when its surrounding frame is tilted, and are thus labeled as field dependent because they seem unable to separate the figure from the ground in which it is embedded. Those who are not overly influenced by the field in which the figure is placed and do a good job of adjusting the chair or the rod to the upright are called field independent (Maccoby & Jacklin, 1974).

Another test, a paper and pencil test called the Embedded Figures Test (EFT), yields roughly the same kind of results as the BAT and RFT. In the EFT the subject is required to identify or locate simple figures that are camouflaged by more complex background figures. Over the years, a substantial body of data were amassed to indicate that field dependence is a relatively stable, consistent trait, having a certain amount of generality, and that there are significant correlations between the orientation tests and the EFT (Anastasi, 1976).

Witkin, Dyk, Faterson, Goodenough, and Karp (1962) have found sex differences in various tests of spatial discrimination, including the Embedded Figures Test. The EFT does not show a sex difference for ages 3 to 5 or the early school years. But beginning at about age 8 and continuing into adulthood, studies become inconsistent. A substantial number of studies find no sex differences, but when differences are found, they show higher scores for males from age 8 into adulthood, with a suggestion that the differences may disappear in old age (Hoyenga & Hoyenga, 1979; Maccoby & Jacklin, 1974; Sherman, 1967).

According to Witkin et al. (1962) males have an analytic or field independent cognitive approach while females have a global or field dependent cognitive approach. Women are less able to break the perceptual set and isolate figures from a misleading background. According to Bardwick (1971) men are more able to use an analytic approach to the EFT, and they can isolate one aspect of the stimuli from misleading cues. However, a large body of evidence has been amassed showing only a small average sex difference in cognitive approach, and Sherman (1971) notes that this sex difference is not always found.

There has been a good deal of interest in the nature of this sex difference. Tavris and Offir (1977) point out that there have been a number of studies that present inferential evidence of a sex-linked genetic contribution to spatial ability in general. Data have also been presented that suggest that physically early maturers are field dependent and late maturers

are field independent on the basis of both cognitive and personality measures (Waber, 1977).

It has been suggested by Broverman, Klaiber, Kobayashi, and Vogel (1968) that the advantage of males on measures of field dependence indicates a general male superiority on tasks that involve an inhibition of initial response tendencies to obvious stimulus attributes, in favor of responses to less obvious stimulus attributes. Females have an advantage on tasks that are overlearned repetitive behaviors that call for minimal central mediation. They theorize that these sex differences have much to do with the balance of estrogens and androgens on sympathetic and parasympathetic nervous system pathways, but this interpretation has been challenged by Parlee (1972).

Many of the Witkin findings have been applied to cross-cultural settings in an attempt to relate them to cultural factors, especially child rearing practices (Berry, 1966; MacArthur, 1967; Whiting & Edwards, 1973). When children of both sexes are allowed considerable independence, as in the permissive Eskimo culture, no sex difference has been found in spatial ability, whereas substantial sex differences have been found in a restrictive African culture in which males exercise strong authoritarian control over females.

Maccoby (1966) enlarges on Witkin's ideas pointing out that we know from diverse studies that girls in the American culture are more dependent, more conforming, and more suggestible than boys, and that these are the characteristics associated with global perceiving, or field dependency, and with the lack of analytic ability that allows one to break a set and restructure a problem. Recently, Hulfish (1977) found that among college students males are significantly more field independent than females, although those subjects whose role identification was relatively masculine were more field independent than those subjects whose role identification was more feminine, regardless of biological sex.

If sex differences, as suggested by the Witkin evidence, have such a profound effect on perceptual processes, then it is not unreasonable to expect that these perceptual differences might be reflected in other more basic ways. One of the ways might be in the basic mechanism of perceptual instability. Studies of creativity suggest that creative behavior is significantly related to field dependence/independence (Morris & Bergum, 1978), with the field independent individual being more creative, regardless of sex. Other studies by Bergum and Bergum (1979a, 1979b) have shown that perceptual instability is related to visual creativity. Perceptual instability is assessed by frequency of perceived reversals of ambiguous figures. Those that are more perceptually unstable see a higher rate of reversals per unit time than those who are more perceptually stable. This creativity is reflected in two ways. First, those who are more perceptually unstable tend to choose careers related to visual creativity, such as architecture and engineering, regardless of sex. Second, those who display higher perceptual instability perceive of themselves as more creative on self-perception tests, again regardless of sex.

It is noteworthy that those groups traditionally associated with masculine career choices are those associated with high perceptual instability, whereas those groups traditionally associated with feminine career choices are those associated with low perceptual instability. Curiously, preliminary evidence (Bergum, & Bergum, 1979a, 1979b) suggests that within these groups the ordering of females in terms of reversals is similar to that of males in the same groups. This raises the question of the extent to which demonstrated perceptual differences between males and females are biologically determined and the extent to which they are a product of the environment.

Many of the skills and personality qualities that relate to creativity also relate to sex differences. Males are said to be superior in breaking a set, in restructuring problems, and in logical thinking, while females are said

to be more afraid of failure, more conforming, more rule-obeying, more dependent and less confident. Female thinking is said to be less analytic, more global, and more perseverative. These are the same qualities used to describe field dependence. The stereotyped male, like the sterotyped female, is not creative. The creative person resists pressure to be limited and conform to the sex-role stereotype. The stereotyped characteristics of femininity, including passive-dependent characteristics have been rated by clinicians of both sexes as less mature, less healthy, and less socially competent than the stereotyped description of masculinity (Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970; Gove, 1972). This in turn has led to much current interest in the examination and avoidance of sex biases for both sexes on the part of both clients and mental health professionals, especially in the area of career counseling.

The purpose of this study was to test the hypothesis that field independents would show greater perceptual instability, regardless of their biological sex.

The subjects were 240 undergraduate students, 120 males and 120 females, in each of 6 career areas. There were 40 each majoring in Architecture, Business, Education, Engineering, Liberal Arts and Science. They were asked to respond to the Group Embedded Figures Test (Witkin, Oltman, Raskin, & Karp, 1971), and also to indicate perceived reversals of six projected ambiguous figures, each presented for 60 seconds. The figures and procedure were those found to be highly reliable (Bergum and Bergum, 1980) in previous research.

No sex differences were observed in either measure. As predicted, the more field independent individuals also displayed significantly more figural reversals regardless of sex. The coefficient of correlation yielded an $r = .36$, $p < .0001$, $df = 238$. The scores for both the Group Embedded Figures Test and number of figural reversals were ordered along a dimension of careers reflecting degree of visual creativity. Thus, for example, architecture

and engineering students generally show more field independence and perceptual instability, and education and business majors show more field dependence and perceptual stability. Liberal arts and science students are generally in the middle range. It is suggested that these data have implications for non-sexist career counseling.

Although over the years Witkin and his colleagues presented evidence for sex differences in field dependence, the present study adds to the cummulating evidence that biological sex in and of itself, is in fact not a variable in field dependence. This may be a result of the changing socialization process that has taken place in the United States in the last 20 years.

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